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NATIONAL CANNERS ASSOCIATION

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Raw Products Research Activities

Washington Pear, Asparagus, Bean, Corn, and Berry Studies Are Reported

Inspection during 1941 revealed a still wider distribution of the pear psylla in the State of Washington, although with the exception of the Entiat Valley the insect has not yet been found in the main pear-growing districts of the Pacific Northwest. In most cases where the insect was found in new locations, the infestation was light—usually only a trace. This project is in cooperation with the States of California, Oregon, Idaho, Montana, and the province of British Columbia. In some orchards in the Spokane Valley, severely infested when the insect first was found there in 1939, the pear psylla could be found only after thorough search by competent inspectors, due to the intensive spray program under the supervision of Federal authorities.

Asparagus miner in Eastern Washington

Adult flies of the asparagus miner were observed in large numbers in practically all asparagus fields examined from the Tucannon River in Columbia County to Toppenish in Yakima County. In the same fields, mines in the stalks were very noticeable after the first of July. During the cutting season the flies are forced to oviposit in volunteer stalks. Apparently the flies prefer to oviposit in developing stalks rather than marketable spears or mature stalks. Eggs are deposited in the stalks near ground level, even below ground level when the flies can find a crack in the soil.

The maggots mine between the epidermis and schlerenchyma, in many instances destroying all the cortex for a distance of two or three inches above and below ground level. The destruction of the cortex in this region does not seem to affect the asparagus plant adversely for in no case has it been possible to directly associate mining with dying or weakened asparagus plants.

Asparagus beetle in Eastern Washington

As reported in 1940, during the cutting season the overwintering beetles fed and deposited eggs for the most part on volunteer stalks, seedling beds, and other uncut plants. The first generation of beetles following the overwintering brood appeared early in June. Because of the delayed growing season many fields still were being cut at this time but the spears were not appreciably damaged. The beetles tended to congregate in fields in which stalks were allowed to grow, or upon volunteers. However, the abundance of beetles, in some cutting fields, necessitated dusting with rotenone.

Various insecticides were applied July 11 to asparagus plots at the Irrigation Branch Experiment Station. Paris green, lead arsenate, calcium arsenate, cryolite, pyrethrum, and rotenone all resulted in practically 100 per cent control three days after treatment. The arsenicals and cryolite were applied as dusts at 10 per cent and 33 per cent with pyrophyllite as the diluent and as sprays at two pounds per 100 gallons of water. The rotenone materials used were commercial dusts containing .5-1.00 per cent rotenone and the pyrethrum dusts contained .1-.2 per cent pyrethrins. All dusts were applied at about 25 pounds per acre.

Fertilizer test on asparagus

Fertilizer applications of both organic and inorganic materials were applied in December, 1940 to the Walla Walla asparagus plots. The basic treatment was 80 pounds of N.P. or K. Yield records following three treatments thus far do not show any significant response to fertilizer applications. The asparagus was planted in 1939, and has just reached its normal production peak.

Nitrogen applications to older asparagus plots located at the Irrigation Branch Experiment Station increased yields appreciably.

Bean rust

In the hope of finding a rust-resistant bean to replace the extremely susceptible Blue Lake variety now being grown in western Washington, tests were made near Everson with a Blue Lake hybrid which showed considerable promise in type, yield, and rust resistance. Due to weather conditions the rust came too late in the season to cause serious damage to the crop, but following harvest it practically defoliated the Blue Lake variety, whereas the leaves of the Blue Lake hybrid remained attached and showed little effect of the rust when the vines were harvested for feed a week or two later. According to data taken, the yields from the hybrid were somewhat greater than those from the Blue Lake variety, but canners who made packs of both expressed a definite preference for the latter because of its straighter, smoother, and meatier pods.

Growing lima beans

Adverse weather conditions both at the beginning of the lima bean season (June) and during maturity (September and October) caused considerable difficulty in growing this crop. Henderson Bush, Maryland Thick Seeded, and Concentrated Fordhook were the only varieties that yielded over a ton of shelled green beans to the acre.

Soybean varieties

Of all of the varieties of edible soybeans tested, Bansei was the most promising both from the standpoint of yield and quality. Yields varied from 1,331 pounds to 3,232 pounds per acre. These extremes in yields apparently were due to a difference in available moisture. On account of

a general shortage of irrigation water, certain plots were extremely dry during periods of high temperature.

Bean yields

Time plantings of Stringless Green Pod, variety of bush green bean, made throughout the entire growing season, indicated that plantings made July 3, July 15, and August 1 produced high quality beans with little damage from the curly top virus. Yields obtained from the two July plantings were 7.36 tons and 5.99 tons per acre, respectively.

Corn ear worm control

Although infestation was negligible in most tomato plantings, early sweet corn was 18 per cent infested and increased to 80-90 per cent by mid-season. Late corn was practically 100 per cent infested.

Control of this insect on sweet corn has been the objective of a number of experiments with the mineral oil injection treatment during the 1941 season. None of the treatments proved satisfactory. If the treatments were applied early enough to stop the worms (12 to 14 days before harvest) the tip inch or two of the cob failed to develop kernels. If the treatments were delayed until ten days before harvest, worm damage already had occurred.

The oil injury accompanying reasonable worm control, plus the tedious hand labor involved, raises a serious question as to the practicability of the whole method under Washington conditions. Canners who cooperated in some of the tests considered that the loss due to oil injury was equal to the loss due to worm damage.

DN again gave the best results in worm control but caused severe rotting of the ear tip. Phenothiazine, dichlorethyl ether, and pyrethrum extract also were tested with varying results.

Raspberry breeding

The Washington and Takoma varieties, originated under this project, produced their first commercial crops in 1940. One grower near Puyallup reported a record first-crop yield of more than five tons from one acre of Washingtons. There was considerable new planting of these varieties, including approximately 50 acres in Whatcom County, where red raspberry growing has been abandoned for the last several years. The first evidence of disease on the Washington variety was observed in that county. The disease has the appearance of anthracnose, which has not been a serious disease of the red raspberry in western Washington. On the Washington variety it shows evidence of becoming serious.

Breeding cranberries

This project was initiated in 1941 to develop a variety adapted to Pacific Coast conditions with bright fruit color, upright growth habit, high yield and quality, and maturing several weeks earlier than McFarlin, which is the present major variety. The need for a high-yielding, high-quality variety with upright growth habit which can be scooped has become urgent as the labor supply for hand picking is not sufficient and the cost excessive. Likewise, an early maturing variety that can be harvested before the fall rains begin is needed.

Approximately 780 crosses were made resulting in 99 berries. Studies are in progress on methods of germinating the seeds and producing seedlings.

Cranberry tipworm

The cranberry tipworm caused considerable injury in several bogs in the Grayland and North Cove districts. The injury is caused by the maggot feeding in the tips of the new growth. When the tips are injured late in the season by the second brood of tipworms, no fruit buds are set for the next season's crop. In a few of the bogs injury to the tips was severe enough to affect the coming season's crop. Preliminary spray tests indicate that the tipworm can be controlled by rotenone sprays, but the best time to apply the spray has not yet been determined.

Reference: Fifty-first Annual Report, State College of Washington Agricultural Experiment Station, Pullman.

Recent Progress in the Production and Marketing of Canning Crops in Maine

Concise and up-to-date information concerning the production and marketing of canning crops in Maine is contained in a recent bulletin issued by the Agricultural Experiment Station at Orono. The bulletin is not a treatise on growing and marketing canning crops; rather it is a summary of progress made along those lines in the last few years. It is intended for busy growers and canners who wish to keep posted on the latest developments in the industry in those fields.

Among the services now available to growers and canners in Maine are soil testing, cooperative growing of hybrid sweet corn seed, Federal-State inspection of each load of canning crops delivered, and constant research in growing and marketing of canning crops.

The crops discussed in this bulletin are sweet corn, peas, beans, squash and blueberries.

Descriptions of yellow hybrid sweet corn varieties grown in Maine are given, the soil and fertilizer requirements of this crop are outlined, together with rates of planting and production methods to obtain highest yields. Recommendations are given for control of European corn borer and other insects affecting sweet corn.

The soils best suited for peas, the place of this crop in the rotation, and the fertilizer necessary for a good crop are discussed. Control measures for pea aphid and for powdery mildew and root rots are recommended.

Of the round-podded green beans, Full Measure produced the highest yield in experimental plots. Planting rate experiments with this variety indicate that there is little or no increase in yield when plants are spaced closer than three inches in the row. Soil and fertilizer requirements for this crop are given and control measures for Mexican beetle and bean weevil are discussed.

Striped cucumber beetle, squash vine borer, and squash bug attack squash grown in Maine, and dust treatments for these pests are outlined. The squash bug can be controlled only with considerable perseverance.

The most important methods of increasing yields of blueberries are weed control, introduction of honeybees, and three-year burning. Control measures for weeds, insects, and diseases are recommended in this publication.

Reference: "Recent Progress with Canning Crops in Maine", Extension Bull. 304, Maine Agricultural Experiment Station, Orono.

Baltimore Conference on Pea Aphid Control

Canners, entomologists, insecticide manufacturers, and machinery manufacturers attended a conference in Baltimore March 12, to review control recommendations and to formulate suggestions for 1942 in the light of the decreased supply of rotenone.

A progress report was presented covering four years work on pea aphid control in Maryland. The discussion of data was arranged to answer as specifically as possible the following three questions: (1) Are treatments for pea aphid annually profitable in Maryland?; (2) When can we expect pea aphid infestations?; (3) What is the pea aphid problem as it stands today, and what should be done about it?

Results of aphid control work in Virginia and New York were discussed by entomologists from those States and manufacturers of insecticides discussed the supply situation.

Reference: "Report of Pea Aphid Conference in Baltimore, Maryland, March 12, 1942". Copies available to members on request to the Association's Raw Products Bureau.

Growing Vegetables for Canning in Oregon

Problems in growing vegetables for canning and freezing in the Northwest are discussed in a recent publication prepared by the Oregon State College. The crops covered in this circular include asparagus, snap beans, lima beans, beets, broccoli, brussels sprouts, cauliflower, celery, peas, spinach, sweet corn, and tomatoes. Information is included on varieties best adapted to the Northwest, damage to the crop in the field due to disease, insects, or other causes, fertilizers, seed treatment, and irrigation.

Reference: "Problems in Growing Vegetables for Canning and Freezing." Circ. of Information 264, Oregon State College, Corvallis.

Tapered Boom Type Duster for Pea Weevil

Plans and instructions for building a tapered boom type field crop duster for use in controlling weevil on peas and vetch have been prepared by the Oregon State College. This type duster is generally considered simpler and lighter and is usually easier to build and operate than the hood type duster. The entire unit can be mounted on a light truck or pick-up for field operation. The truck or pick-up must have a low gear that is low enough to operate over crop lands at 4 to 5 miles per hour.

Reference: "Plans and Instructions for Building a Tapered Boom Type Field Crop Duster." Circ. of Information 262, Oregon State College, Corvallis. Copies available to members on request to the Association's Raw Products Bureau.

Vegetable Soybeans for Iowa

The vegetable soybean is a new crop for the Iowa farm garden and the Iowa canner. Eighty-nine vegetable varieties and four field varieties of soybeans were tested for desirability as a human food. Three vegetable varieties of different maturities were selected as most desirable under Iowa conditions: Sac, a very early variety; Kanro, a mid-season variety; and Jogun, a late variety.

Reference: "Vegetable Soybeans." Bul. P39 (New Series), Iowa Agricultural Experiment Station, Ames.

Peach Disease and Tomato Fertilizer Studies Conducted at Delaware Station

Studies of particular interest to canners being conducted at the Delaware Agricultural Experiment Station are those relating to peach diseases and tomato fertilizers.

PEACH DISEASES

Peach yellows and little peach investigations have been continued with the budding of 2,000 Elberta peach trees with buds from several hundred wild and cultivated plums. It has been demonstrated that the plum is the chief host in harboring the virus diseases of yellows and little peach, and at the same time these plums are breeding the vector—the plum hopper that disseminate these diseases to the peach. This investigation also has shown that the backyard plantings of peaches and plums, which often are neglected, are active factors in the spread of these diseases to the commercial peach orchards.

The culture work on the bacterial spot of peach shows the organism over-winters chiefly in the terminal buds of peach. Although present in the lateral buds during August and September, the bacterium gradually dies out through October, November, and December, until in January and February less than one per cent of the lateral buds carry infection, whereas from five to ten per cent of the terminal buds carry infection. With this terminal bud infection, the disease quickly is disseminated in the early growth by spring rains, thus starting the entire cycle over again.

The yellow-red virosis of peach ("X" disease), although reported as reaching most of the northern States including the New England States and others to Wisconsin, as well as Ontario, has not as yet reached Delaware. This may be due to the fact that choke cherry has not been found growing in the State. The vector apparently breeds on the choke cherry and from there carries the disease to the peach.

TOMATO FERTILIZERS

Observations made the first year were to the effect that lime did not produce any beneficial results and that a 1-2-2 fertilizer ratio seemed desirable. Other indications were that broadcast applications were more desirable than row applications or side dressing and that late side dressings were of no advantage.

Reference: Annual Report of the Director for the fiscal year ending June 30, 1941, Bul. 235, Delaware Agricultural Experiment Station, Newark.

Vegetable Seed Treatments

The object of this bulletin is to bring together the recommendations for treating the different kinds of vegetable seeds. The diseases that are affected by the treatments are indicated, and abbreviated directions for applying the treatments are given. Much progress has been made in seed treatment in the two years since the first edition of this bulletin in 1940, and the present revision supersedes the earlier issue.

Among the many crops for which seed treatment directions are given are asparagus, beans, beets, cabbage, carrots, corn, lima beans, peas, peppers, spinach, and tomatoes.

Reference: "Vegetable Seed Treatments." Farmers Bul. 1862, revised March, 1942. Copies for sale by Superintendent of Documents, Washington, D. C., at 5 cents each.

South Carolina Prepares Economic Survey of Its Commercial Canning Industry

A comprehensive economic study of the commercial canning industry in South Carolina was begun by the State Agricultural Experiment Station during the early part of the summer of 1941. Records were taken on 19 of South Carolina's 20 commercial canneries. The data are applicable to the 1940 canning season, which was characterized in general by a less-than-normal output. Even in that year, there was not a single month during which all of the South Carolina canneries were idle. It should be pointed out that to operate during a certain month does not mean to operate the whole of the month. The analysis shows that South Carolina's canning industry, as it is now operated, is a seasonal industry of four or five months' average duration, but with extremes of two months and nine months.

From information obtained, it is shown that in 1940 the State's canning industry operated at only about 24 per cent of what is a conservative estimate of its capacity. Canners in South Carolina are almost unanimous in stating that the relative smallness of their pack is due to their inability to obtain regularly raw products of desired quality in sufficient quantity. It follows, then, that for the State as a whole it is not necessary to build additional canneries in order to increase even by a tremendous amount the quantity of fruits and vegetables canned in the State. During 1940, the existing canneries in the State, could have canned four times the quantity actually packed, in the same operating periods.

The date and duration of the canning season for products packed in South Carolina is shown in a graph. The relationship between actual pack and estimated canning capacity of existing plants is shown in table form, for green beans, peaches, tomatoes and turnip greens.

Peach canning tests

To enable the South Carolina Experiment Station to study the possibility of processing peaches produced in the State, the South Carolina General Assembly made an appropriation in 1940 for the establishment of a horticultural products laboratory. During the 1941 season 36 varieties of peaches were canned, and a table gives information on flesh color, adhesion to pit, date of full bloom, picking dates, color and flavor of the peaches canned. Additional details also are given on the following varieties for canning purposes: Golden Jubilee, Sunbeam, Ambergem, Vedette, South Haven, Valiant, Halehaven, Globe Haven, Early Elberta, Elberta, Halberta, Shippers' Late Red, and Augbert.

Tomato fruit worm control

Cornmeal baits gave slightly better control than dusts in an experiment conducted at the station. The bulk of the evidence is in favor of a cornmeal bait with one of the following insecticides added: Natural cryolite, synthetic cryolite, calcium arsenate, air-floating paris green, and phenothiazine. Choice of the optimum concentration and the best material await a year when weather conditions permit a more sensitive test. The results bear out previous evidence that highly diluted dusts are practically valueless in tomato fruit worm control.

Vegetable-type soy beans

Several varieties have been on trial at this station and a table gives information on number of days to bloom, number of days to mature, height in inches, and bushels per acre of dry beans of a number of varieties which seem to be most nearly adapted to this region.

Bean fertilizer experiments

Results of a fertilizer placement test with green beans favored band application 2½ inches on each side of seed applied at planting. From a comparison of two rates of application, it appears that when beans are grown on fairly good soil that has received an average annual application of 800 to 1,000 pounds of fertilizer, 600 pounds of a mixture such as 4-12-4 may be expected to produce as good yields as larger quantities.

Pea fertilizer experiment

Mixing the fertilizer in the row at planting time significantly reduced the stand of plants. No significant reduction in stand occurred when the fertilizer was mixed in the row eight days before planting. However, many of the plants on all of the plots where the fertilizer was mixed in the row showed signs of damage. The roots of these damaged plants were burned by the fertilizer. No damaged plants were observed on the plots where the fertilizer was applied in bands.

Because of the ideal conditions for germination and growth of peas during the first part of the 1941 season, practically no root rot was found. If root rot had been prevalent, the plants that showed fertilizer burning probably would have been destroyed by this disease instead of recovering as they did.

Observations in commercial fields in the Holly Hill area during the past four years indicate that fertilizer burning is the cause of many crop failures. Root rot has been charged with the responsibility of poor stands when the basic trouble has probably been fertilizer injury to the seedlings.

The fertilizer used was 5-10-5, and when applied in bands there was no significant difference in yield as between 800 and 1,200 pounds per acre.

Sweet potato breeding

Extension work is in progress on improvement of sweet potato varieties. An improved strain designated as Porto Rico E-24 has been developed from a hill selection of Louisiana Porto Rico that produces a high yield of smooth, well-shaped uniformly-colored roots. Seed stock will be available for bedding in 1942.

Reference: Fifty-fourth Annual Report of the South Carolina Experiment Station, for the year ended June 30, 1941. Clemson, S. C.

Causes, Effects and Control of Tomato Defoliation

Practical aspects of the tomato defoliation problem are discussed in a recent publication of the Connecticut Agricultural Experiment Station and suggestions are made, based on studies conducted during 12 seasons, with the objective of exploring the whole field of defoliation diseases of tomatoes. It is pointed out that the question of whether to spray or not to spray cannot be answered categorically but must be decided by a grower on the basis of his market for this crop.

The research included a study of the various factors that are involved in the causes of defoliation, such as fungi and insects, abnormal physiology and weather. A method was devised for measuring the intensity of infection. The effects

of defoliation on total yield, marketable yield or quality, and rate of ripening were examined.

The primary cause of defoliation in the Northeast is *Alternaria solani*, but optimum conditions for the disease must prevail before attack sets in. These include: (a) crowded plants, (b) maturity of leaves, (c) heavy fruit load, (d) above normal rainfall and dew and (e) shading. Disease, of course, may appear when one or more of these conditions are not fulfilled, but they all seem to play a part.

During the period of this research an extensive study of fungicides was made to determine, if possible, the reason why Bordeaux depresses the growth and yield of tomatoes, and to develop new fungicides to combat the disease without injury.

Information is included on the materials to use for spraying, how to apply them, timing of spray applications, the importance of using certified seed, and cultural practices which aid control of the disease.

Reference: "Causes, Effects and Control of Defoliation on Tomatoes." Bul. 456, Connecticut Agricultural Experiment Station, New Haven. Copies available to members on request to the Association's Raw Products Bureau.

Why Georgia Peach Trees Are Short-lived

The short life span of trees is one of the most important economic problems confronting the peach grower in Georgia. This is especially true in the south Georgia peach section, where it is unusual to find orchards 10 or more years of age still having a good stand of trees. In the central and north peach sections of the State trees are much longer-lived.

Winter injury in its various forms is the principal factor affecting longevity of peaches in Georgia. Fertilizer applications sufficient to maintain a normal, vigorous growth aid materially in its prevention. Other important factors affecting length of life of peach trees include peach borer, erosion, variety, site, exposure, pruning practices, and phony disease.

Reference: "Factors Affecting Peach Tree Longevity in Georgia." Bul. 219, Georgia Experiment Station, Experiment. Copies available to members on request to the Association's Raw Products Bureau.

Fertilizers for Washington Crops

The purpose of this handbook is to furnish the best information now available at the Washington Agricultural Experiment Station concerning the use of commercial fertilizers in the State.

There are two distinctly different climatic zones in Washington; one west of the Cascade Mountains with abundant rainfall and relatively uniform temperatures and the other east of the mountains with limited rainfall and wide variations in temperature. In each area, distinction should be made between upland and lowland soils when considering soil management and fertilization.

Tables are included showing fertilizers recommended in pounds per acre of nitrogen, phosphoric acid and potash, for a large number of crops in both eastern and western Washington and on irrigated and non-irrigated land.

Reference: "The Farmer's Fertilizer Handbook." Popular Bul. 165, Washington Agricultural Experiment Station, Pullman.

Pole Bean Breeding and Cold Resistance of Pea Varieties Studied at Alabama

Studies on yield and root-knot resistance with three leading lines of pole snap beans developed by the Alabama Station and several commonly grown commercial varieties have been carried on for three years on two different sites at Auburn.

The results show that Alabama 25 and Alabama 1 are higher yielding beans than Kentucky Wonder at Auburn, and that Alabama 18 is at least as good, on the average, as the latter. In addition, Alabama 1 and Alabama 18 are very resistant to root knot.

Alabama 18 is especially valuable as a breeding parent as it has green pods and root-knot resistance combined in the same plant. Apparently the genes for resistance and for green pods are linked because crosses between Alabama 1 and Kentucky Wonder, which have been made at Auburn, have yielded a very low percentage of green-podded resistant plants. Many more such plants should be obtained in crosses with Alabama 18, giving a much wider range of selection for other desirable characters.

Alabama 25 is valuable as breeding material because of its high yielding ability. However, it is not resistant to root-knot.

During early January, medium severe freezes injured the earlier plantings of World's Record, Alaska, Little Marvel, and Thomas Laxton, in order, from worst to least injured. Nine other varieties were slightly and about equally injured. Willets Wonder (both Asgrow and Alabama strains) were not visibly injured. The very low temperatures of late January (lowest was 7 degrees F.) completely killed all plants above ground at that time, except the first planting of Willets Wonder and a few plants of Stratagem Improved in the same planting.

A later freeze on the night of April 12 injured the last plantings slightly. On the basis of injury, varieties were classified as follows:

No injury: Willets Wonder, Stratagem Improved, Dwarf Alderman, Creole, Hundredfold, Blue Bantam.

Slight leaf injury: Thomas Laxton, Laxton's Progress, Alderman, Whirlwind, Laxtonian, Little Marvel.

Medium leaf injury: World's Record, Alaska.

As in previous years, and contrary to the prevailing belief among gardeners in Alabama, Thomas Laxton, and Alaska were among the least hardy varieties.

Reference: Fifty-first Annual Report of the Agricultural Experiment Station of the Alabama Polytechnic Institute, Auburn.

Production of Tomatoes for Canning

A revision of an earlier publication describing the production of tomatoes for canning and manufacturing has just been issued by the U. S. Department of Agriculture. Information is given on the distribution of the tomato processing industry, the methods followed by canners to obtain a supply of tomatoes, the selection and preparation of tomato soils, the importance of good seed and plants, setting plants in the field, transplanting solutions, cultivation, and control of diseases and insects.

Reference: "Production of Tomatoes for Canning and Manufacturing." Farmers Bul. 1901, U. S. Department of Agriculture. Copies for sale by Superintendent of Documents, Washington, D. C., at 10 cents each.

Circulars on Peach and Cherry Diseases

The X-disease of peach has been found in most of the counties east of the Cascade Mountains in Oregon. It also affects cherries and the wild chokecherry, the latter being the native carrier of the disease. Symptoms of this virus trouble are described and control methods suggested in a recent Circular of Information published by the Oregon State College.

The same institution has recently published recommendations for control of peach leaf curl, caused by a fungus which affects the leaves, twigs, blossoms and fruit of the peach tree.

Since it is possible to combine the lead-arsenate spray for both Syneta beetle and fruit fly on cherries with the lime-sulphur for cherry leaf-spot control, a spray schedule has been worked out for control of these hazards, and published in another Circular of Information by Oregon State.

Reference: "X-Disease of Peach in Oregon." Station Circ. of Information 256; "Peach Leaf Curl." Station Circ. of Information 255; and "Spray Program for the Control of Sour Cherry Leaf-Spot, Syneta Beetle, and Fruit Fly." Station Circular of Information No. 253, Oregon Agricultural Experiment Station, Corvallis.

Peach Varieties Adapted to Canning are Subject of Studies at University of Georgia

In 1932 the Department of Horticulture of the College of Agriculture of the University of Georgia started the development of a peach variety orchard. One objective of the variety orchard established in the department farm was to obtain information relative to a peach for canning which would be adapted to Georgia conditions. Actual canning tests were started during the 1939 season on varieties that were then in production.

Peaches for the canning experiments were harvested at various stages of maturity. Freestone varieties were peeled by two different methods, namely, with lye and with heat, while clingstone varieties were peeled only by the former method. All of the peaches were packed with a 50 per cent syrup, exhausted and processed under uniform conditions. The canned products were stored for six months at room temperature before sampling.

Flavor, color, and texture were considered the factors of prime importance in judging the quality of the canned peaches. Each factor was scored on the basis of ten with a breakdown of the value as follows: 1-4 unacceptable, 5-7 acceptable, and 8-10 very good. Any sample was disqualified which scored four or below on any single factor.

The two varieties that have proved the most satisfactory for canning, to date are: First, the Amber Gem, and second, the South Haven. These two also represent the top ranking varieties in the clingstone and freestone classifications. The Amber Gem is a clingstone which produces a medium to large yellow peach. The canned product has good flavor, and an attractive yellow color. The halves are tender, retain their shape and are free from fibers. To date the Amber Gem has not been scored below eight on any of the three factors. The South Haven is a freestone which produces a large yellow peach. This fruit, when canned, has a characteristic peach flavor and a deep yellow color. The pit cavities are of medium size and the halves retain their shape well, due to the thick wall of flesh. Fibers are not numerous, but are present around the pit cavity. To date this variety has not been scored below seven on any of the three factors considered.

Two varieties have failed to produce a satisfactory canned product. These are Foster and Nectar. The former is a yellow freestone which had the tendency in the orchard to produce many undeveloped fruits. The variety, when canned, produced halves with large pit cavities, numerous large fibers and retained a slight greenish yellow color which was present in the fresh, ripe fruit. The variety Nectar is a white freestone and is most desirable as a fresh product. The canned product from this variety had no outstanding factors in its favor.

Other varieties are under observation, but definite conclusions regarding them will have to await further experimental packs. When additional information is obtained other varieties may be found that will equal the canning quality of the Amber Gem and the South Haven.

Reference: Annual Report of the College of Agriculture of the University of Georgia for the fiscal year ending June 30, 1941, Athens, Ga.

Boron Deficiency Disease in Cabbage

The results of an experiment conducted in Wisconsin in both greenhouse and field on the internal break-down of cabbage and such closely related plants as kale, collard, and sprouting broccoli when boron deficiency in the soil, have recently been reported. Cauliflower was found to be much more subject to internal breakdown on boron-deficient soil than cabbage, kale, collard, or sprouting broccoli. Of the several varieties of cabbage tested the early-maturing ones—Golden Acre and Resistant Detroit—showed the greatest amounts of internal breakdown. Applications of 20 pounds or more of borax per acre practically (though not entirely) eliminated the disease and these applications were equally effective when the second successive crop of cabbage was grown, without further treatment of the soil with borax. Salts of manganese, copper, iron, zinc, and sodium applied to the soil had no effect upon the occurrence of internal break-down.

Reference: "The Boron Deficiency Disease in Cabbage." Journal of Agricultural Research, May 15, 1941.

Recent Spread of Japanese Beetle

Trap scouting to determine the possible distribution and status of the Japanese beetle in localities outside the area regulated by the Federal quarantine was carried on during the summer of 1941 and a statement summarizing the results recently has been published by the U. S. Bureau of Entomology and Plant Quarantine.

Soil treating programs to suppress outlying infestations have been completed, or definitely arranged for, in Georgia, Illinois, Indiana, Michigan, Ohio, and Vermont. Soil treatment has been completed in one area in New York and in the expectation that treatment will be applied at Niagara Falls, consideration of adding this section to the regulated area at this time is being deferred.

The beetle collections for the past season indicate, however, the need for extending the area regulated by the Federal quarantine to include limited sections in Maryland, New York, Pennsylvania, Virginia, and West Virginia. It is

planned to make the necessary extensions in the regulated areas in these States in the near future and to make other minor modifications to improve the effectiveness of the Federal quarantine.

Reference: "Japanese Beetle Trapping and Control Operations During 1941." U. S. Bureau of Entomology and Plant Quarantine, Washington, D. C. February 23, 1942. Copies available to members on request to the Association's Raw Products Bureau.

Comparison of Tomato Plants Grown in Georgia and Ohio

On the basis of comparisons of tomato plants grown in Ohio and in Georgia from the same lot of seed treated with certain spray formulas, southern-grown plants, properly grown, sprayed, packed, and shipped are potentially capable of producing as large a crop of tomatoes as Ohio-grown plants. These comparisons were made over a period of three years. The variety Marglobe was used in 1938 and 1940, and Greater Baltimore was used in 1939. The spray materials used included Bordeaux mixture and several of the fixed copper compounds now available for this purpose. Data were collected relative to plant injury and mortality, ripening dates, occurrence and severity of such diseases as stem canker, early blight, Septoria leaf spot, blossom-end rot, and anthracnose fruit rot, and the quantity of green fruit left on the vines at the end of the season.

There was little indication in any of the several comparisons made in these trials that primary infection played any important part in determining the amount and severity of any foliage diseases which developed later in the season. Both the southern-grown and northern-grown plants which were used each year were practically free of disease at the time of transplanting.

Reference: "Comparison of Sprayed Tomato Plants Grown as Seedlings in Georgia and Ohio." Reprint from Jan.-Feb., 1942 Bimonthly Bulletin, Ohio Agricultural Experiment Station, Wooster. Copies are available to members on request to the Association's Raw Products Bureau.

Tomato Investigations in New Mexico

Fifteen varieties of tomatoes were tested at the New Mexico Agricultural Station during the season of 1940. The outstanding varieties of the 1939 tests, together with two new ones, were grown in the experimental plots. The two varieties grown for the first time were Essar and Bloomsdale, neither of which showed any promise under local conditions. For the second consecutive year, Pearson appeared to be the outstanding variety. From the standpoint of the yield of marketable fruits the five leading varieties were Bonny Best, Pearson, Stokesdale, Nystate, and Pritchard.

Investigations of varietal resistance to western yellow blight were continued in 1940. The data secured were inconsistent and extremely variable and failed to show any significant difference between varieties. The data when calculated on the basis of percentage of healthy plants indicated that the Rutgers variety was the most resistant, with a percentage of 71.6. Other varieties were: Bonny Best, 65; Pritchard, 59.3; Master Marglobe, 56.7; and Pearson, 55.6.

Reference: Fifty-second Annual Report of the New Mexico Agricultural Experiment Station, State College.

Carrot Weevil in New Jersey and Its Control

The nature and extent of the injury caused by the carrot weevil to carrots and celery in New Jersey are described and control measures are recommended. For controlling this insect, a poison apple bait has proved most effective, cheapest, and easiest to apply of any method tried. Poison apple bait may be purchased ready for use, or a satisfactory apple bait may be made on the farm. Directions are included for preparation, storage, and use of the bait. Tests show that the control methods described reduced injury to carrots approximately 90 per cent when untreated checks showed injury in about one-third of the carrots.

Reference: "The Carrot Weevil in New Jersey and Its Control." Bul. 693, New Jersey Agricultural Experiment Station, New Brunswick. Copies available to members on request to the Association's Raw Products Bureau.

Suitability for Canning of Eastern and Southern Varieties of Peaches Reported

A recent mimeographed report from the U. S. Bureau of Plant Industry brings together all existing information in regard to suitability for canning purposes of most freestone peach varieties grown in the eastern and southern parts of the United States. It also discusses the relation of stage of maturity or degree of ripeness to the development of the characters giving freestone peaches high dessert quality and desirability and appeal to consumers, and the methods which must be employed in harvesting and handling in order to preserve these characters in greatest degree.

The factors that determine desirable quality in canned freestone peaches are the same as those that give the fresh fruit its appeal to consumers. They are an agreeable balance between sugar, acidity, and astringent substances, pronounced and attractive "peach" flavor and aroma, moderately firm yet melting flesh without excessive fiber or stringiness, and attractive color.

The report discusses the changes occurring in the course of ripening, the optimum condition for canning, the methods of handling fruit intended for canning, and gives a table listing nearly 100 varieties of free and clingstone varieties ranking each on appearance, color, texture, flavor, and general suitability for canning. As there is considerable interest in the question whether the clingstone varieties grown for canning in California can be successfully grown and canned in the East, results with a considerable number of these as grown in the latitude of Washington, D. C., are included. As a generalization it is said that these varieties are not well adapted to eastern conditions and that the products made from them when so grown are not comparable with those produced in regions to which they are adapted. On the contrary, Ambergem, a firm-fleshed cling originated at the New Jersey Agricultural Experiment Station, has been of very high quality wherever tested.

Copies of this report are being sent to all peach canners by the Bureau of Plant Industry of the U. S. Department of Agriculture.

Reference: "Varietal Suitability and Methods of Handling Eastern-Grown Peaches for Canning," Bureau of Plant Industry, U. S. Department of Agriculture, May 20, 1942.

Sweet Corn Yield in Relation to Planting Rates Reported in Illinois Bulletin

Experiments were started in 1930 at the Illinois Agricultural Experiment Station for the purpose of determining the optimum distances and rates for planting sweet corn, particularly the two varieties Country Gentleman and Narrow Grain Evergreen, and the results of this study have just been published. The experiments, including the preliminary tests, covered the entire drought cycle of 1930-1936, and since conditions of heat and drought at critical periods in the development of sweet corn may be expected at any time, planting distances and rates for sweet corn in Illinois should be determined by the expectation of heat and drought, rather than of ample rainfall and moderate weather.

A number of tables are included showing the relation between different planting distances and weight of sorted unhusked ears; weight of prime husked ears; number of sorted unhusked ears; weight per prime husked ear; recovery of prime husked ears; and weight of green fodder.

In addition to the effects of rate and distance of planting sweet corn on the various yield components discussed, there were certain effects on the growth habits of the plants not directly measured by the yields. Those on which records were kept were the height of the plants, the number of suckers produced, and the time at which the plants reached maturity.

From the results of this study certain plantings can be recommended for regions whose soils and climate are in general comparable to those at Urbana, Ill., where these studies were made.

In the check-row plantings, Narrow Grain Evergreen can be planted more heavily than the smaller Country Gentleman variety, but in drilled rows the requirements of the two varieties are the same. There is no evidence that plantings in drilled rows produce yields consistently different from those in checked rows.

Cannery growers interested in producing the maximum weights of heaviest ears should plant at the following rates and distances:

Country Gentleman: In checked rows, 40" x 40", with three plants per hill; or in drilled rows 40 inches apart with plants 14 inches apart in the row.

Narrow Grain Evergreen: In checked rows, 40" x 40", with four plants per hill; or in drilled rows 40 inches apart with plants 14 inches apart in the row.

Reference: "Yield of Sweet Corn in Relation to Distance and Rate of Planting." Bul. 487, Illinois Agricultural Experiment Station, Urbana. Copies available to members on request to the Association's Raw Products Bureau.

Wisconsin Studies Pea Wilts and Root Rots

"Pea sick" fields are the result of the accumulation of pea disease fungi in the soil. Several distinct diseases may be involved. The most serious of these—wilt—can be controlled only by the use of wilt-resistant varieties. The other troubles, near-wilt and root rots, unfortunately are not remedied in this manner but much can be done to keep them in check by the proper selection of fields and management of the crop.

While it is not easy to differentiate wilt from root rots, the disease does have certain characteristics which are described in a recent bulletin published by the Wisconsin Agricultural Experiment Station. The relation of soil type to wilt and varieties resistant to the disease are discussed.

Near-wilt differs from wilt chiefly in that it affects wilt-resistant varieties, the disease develops more slowly, and the discoloration of the water vessels is brick-red rather than orange brown and is more likely to run up the entire plant. It does its damage in the late-planted Perfections or in still longer seasoned large-berried sweets, and therefore may be an important factor in tapering off yields during the last two or three weeks of the canning season. The only hope of near-wilt control is through disease-resistant types.

The various root rots are known by the names of the fungi causing them, such as Aphanomyces, Fusarium, Rhizoctonia, and Ascochyta. Symptoms of these root rots are described in the bulletin, and the effect of soil nutrition is discussed. Good cultural practices and use of clean seed are important in control of these root rots.

Reference: "Pea Wilts and Root Rots." Bul. 424, Wisconsin Agricultural Experiment Station, Madison. Copies available to members on request to the Association's Raw Products Bureau.

Liming Missouri Soils for Soil Fertility

The average lime requirements for the different areas of Missouri have been assembled as an outline map reporting soil deficiency published in a recent circular from the State Agricultural Experiment Station. Instructions are given for taking soil samples for testing for lime deficiency. Limestone deposits already within the State may be used, after testing for purity or calcium equivalent. Methods for spreading limestone are described. The circular explains the vital importance of lime in maintaining soil fertility and states that fully three-fourths of the soils of the State are now too deficient in this essential to grow satisfactory crops of clover.

Reference: "Liming Missouri Soils." Circ. 218, Missouri Agricultural Experiment Station, Columbia.

Treatments for Seed Peas in New York State

In the past, the treatment of pea seed has not been urged as a general practice for all growers because of the obvious difficulties in formulating a safe general recommendation for all localities. The New York State Agricultural Experiment Station has conducted critical tests of the more promising new materials and believes that there are few agricultural practices where such a large dividend will be realized from such a modest investment. It is pointed out that while seed treatment cannot solve all the ailments with which a pea crop may be afflicted, it can start the crop out with a fair prospect. At present, treatment with Spergon or other chemicals is recommended for all varieties of canning peas grown in New York except possibly Alaska and Rogers Winner. Further study is needed, however, on the differences in susceptibility of the various varieties.

Reference: "Pea Seed Responds to Treatment," Farm Research, April, 1942, New York State Agricultural Experiment Station, Geneva. Copies available to members on request to the Association's Raw Products Bureau.